COMPUTER TECHNOLOGY: Research and Development
Grades 9-12
Adventures in Computing

Course Description: This course is designed to give students in-depth research and structured programming language skills by using the computer as a tool to assist in the research and the interpretation of data gathered. At the end of the course the student teams will present their findings.

Recommended Prerequisites: Keyboarding

Suggested Prerequisites or Concurrent with: Algebra I/Any Science Course 9-12

Grades: 9, 10, 11, 12

Recommended Credit: 1 Credit

Adventures in Computing

Standards

1. **The student will investigate the use of computers as a tool.**

2. **The student working as a team member will develop strategies for solving a real-world problem.**

3. **The student working as a team member, in collaboration with mentors, will develop a structured computer program.**

4. **The student working as a team member, in collaboration with mentors, will develop a presentation for the real-world problem solution.**

Adventures in Computing

Standard

1. The student will investigate the use of computers as a tool.

   Learning Expectations
   The student will
   1. Identify the importance of computers in solving real-world situations.
   2. Identify the procedures and applications used in solving these situations.
   3. Use the Internet to investigate problems solved by using computers.

Performance Indicators: Evidence Standard is Met

The student is able to

- use the computer as a tool in solving real-world problems.

Sample Performance Task

The student will review and analyze the solution of a real-world problem by using a prepared program.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

2. The student working as a team member will develop strategies for solving a real-world problem.

   Learning Expectations
   The student will
   1. Define team roles.
   2. Research and select a problem topic.
   3. Seek mentors.
   4. Collaborate with mentors to define an hypothesis, mathematical model and method of solution for the problem.

Performance Indicators: Evidence StandardIs Met

The team is able to

- describe the real-world problem to be solved.
- develop a portfolio to chronical project development.

Sample Performance Task

Write a letter requesting mentorship. The letter should include the problem to be solved, the role of the mentor and student team and a timeline for the project development.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

3. The student working as a team member, in collaboration with mentors, will develop a structured computer program.

   Learning Expectations
   The student will
   1. Determine which data types would be appropriate for solving the problem.
   2. Write code for the mathematical model using assignment statements, arithmetic operators, intrinsic functions and logical expressions.
   3. Demonstrate the use of looping structures and/or control statements to implement the program.
   4. Read and/or write data files for input to the program and for output of the results.
   5. Implement arrays, functions and subroutines for the program.
   6. Graph the data using software applications.

Performance Indicators: Evidence Standard Is Met

The team is able to

- design and write in a structured computer language using mathematical modeling appropriate to the problem.
- analyze the conclusions from the visualization of the data.

Sample Performance Task

Each team will develop a mini project demonstrating the fractal for Pascal's triangle.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

4. The student working as a team member, in collaboration with mentors, will develop a presentation for the real-world problem solution.

   Learning Expectations
   The student will
   1. Explain the parts of the technical paper.
   2. Organize and design a visual display.
   3. Practice and critique presentation skills.

Performance Indicators: Evidence Standard Is Met

The team is able to:

- write a technical paper describing the work on the problem.
- create and exhibit a display communicating project results.
- present the solution of the real-world problem.

Sample Performance Task

Students will look at presentations, documents and exhibits, of other projects and critique them.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International